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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/619,125	07/18/2000	Steven T. Jaffe	37384/CAG/B600	9608

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EXAMINER	
PERILLA, JASON M	
ART UNIT	**PAPER NUMBER**
2634	9

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/619,125	JAFFE ET AL.
	Examiner	Art Unit
	Jason M Perilla	2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 23 December 2003.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,2,4,5,7-12,14-19,21-26,28 and 29 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,4,5,7-12,14-19,21-26,28 and 29 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 18 July 2000 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1, 2, 4, 5, 7-12, 14-19, 21-26, 28, and 29 are pending in the instant application.

Priority

2. Priority claim to co-pending Patent Application No. 09/550757 and United States Provisional Applications No. 60/148978 and No. 60/148801 is acknowledged.

Response to Arguments

3. Applicant's arguments filed December 23, 2003 have been fully considered but they are not persuasive.

The applicant asserts that the limitations of independent claims 1, 4, 11, 18, and 25 have not been met by the obviousness rejections set forth in the first office action. Specifically, the applicant asserts that the limitation, "a value of the coefficient of the reference tap is greater than a value of each of the coefficients of each of the other feedforward filter taps", has not been met. However, Turner (5414733), the primary reference of the rejection of the independent claims under 35 U.S.C. 103(a), plainly reads, "As will be described below, the M weighting coefficients corresponding to tap multipliers 53 include a <u>*cursor tap 55 (having the largest `cursor` tap value)*</u> which is displaced a prescribed number (K) of stages z.sup.-1 upstream from the last stage of the delay line 51." (col. 7, lines 17-21). The "cursor tap" is an equivalent of the reference tap. Further, as cited in the arguments filed December 23, 2003, Turner reads, "it has been determined that the coefficient values of the K postcursor taps 71 should be set <u>*at fixed fractions of the largest valued tap 55, namely, a fixed fraction of*</u>

the cursor weighting coefficient W.sub.c associated with the M-Kth received symbol stage of the delay line. For example, the postcursor weighting coefficient values associated with *the last K stages of the feedforward delay line may be progressively decreasing binary fractions of the cursor tap.*" (col. 7, lines 54-68). Therefore, Turner clearly does read upon the limitation that the reference or cursor tap has the largest value.

The applicant presents that Park et al (6259751), the secondary reference of the rejection of the independent claims under 35 U.S.C. 103(a), teaches impulse response filters which are not analogous to the feedforward filter claimed. However, the argument is not persuasive. Park et al teaches analogous art and does provide motivation to combine with Turner. As noted in the argument, Park et al does teach impulse response filters, and one skilled in the art does recognize that a feedforward filter is comprised of an impulse response filter. An impulse response filter is a digital filter having a plurality of reference taps, and it can be utilized as a feedforward filter as is understood by one skilled in the art. As a result, teachings of Park et al are easily applicable to the feedforward filter of Turner, and Park et al does teach a reference tap to be located a center position of the feedforward filter as provided in the rejections below.

Park et al teaches that, "A middle tap, such as tap 311, serves as a reference tap with respect to the taps constituting the qualifying impulse response filter 310. On the basis of tap 311, a right-tap compensates a preceding signal and a left-tap compensates a next signal." (col. 4, lines 39-42). Here, Park et al teaches that the

reference tap (tap of largest value) qualifies as a center tap, and that a right-tap compensates a preceding signal and a left-tap compensates a next signal. Therefore, the teaching presents that the balance and performance of the filter is best when the reference tap is at the center because it would advantageously compensate for both the preceding signals as well as the next signals for optimum performance of the filter.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 4, 5, 9-12, 16-19, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turner (5414733) in view of Park et al (6259751).

Regarding claim 1, Turner discloses a feedforward filter comprising a plurality of feedforward filter taps including a feedforward filter reference tap, a coefficient for each feedforward filter tap, and wherein the reference tap is located proximate a center position of the feedforward filter, and a reference tap having a coefficient value greater than any of the other tap coefficients. Turner discloses a decision feedback filter (DFE) in figure 4 comprising a feedforward filter (ref. 51) with a plurality of feedforward reference taps (ref. 52) each having a coefficient (ref 53; col. 7, line 18), and a reference tap having a coefficient value greater than any of the other tap coefficients (col. 7, lines 18-21). Turner does disclose a reference or cursor tap (fig. 4, ref. 55; col. 7, line 18), but does not explicitly state that this tap is at the proximate center of the feedforward

filter. However, Park et al teaches a feedforward filter (fig 4.) having a reference tap at the proximate center (fig. 4, ref. 311/~~[331]~~, 321, 331, 341; col. 4, line 38). Park et al further teaches that a tap to the right of the reference tap compensates a preceding signal, and a tap to the left of the reference tap compensates a next signal (col. 4, line 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to center the reference tap in the feedforward filter as taught by Park et al in the filter disclosed by Turner because it would advantageously compensate for both the preceding signals as well as the next signals for optimum performance of the filter.

Regarding claim 2, Turner in view of Park et al disclose the limitations of claim 1 as applied above. Further, Park et al discloses that the reference tap is a middle or "center" tap located at a center position (col. 4, line 38).

Regarding claim 4, Turner discloses a receiver comprising a feedforward filter coupled to process signals received by the receiver having a plurality of filter taps including a reference tap, a feedback filter coupled to receive signals representative of an output of the feedforward filter having a plurality of feedback filter taps, wherein the feedforward filter reference tap is located proximate to the center position of the feedforward filter, and the reference tap has a coefficient value greater than any of the other tap coefficients. Turner discloses a DFE (inherently used in a receiver) in figure 4 comprising a feedforward filter (ref. 51) with a plurality of feedforward reference taps (ref. 52) each having a coefficient (ref 53; col. 7, line 18) and a feedback filter (ref. 57) coupled to receive signals representative of an output of the feedforward filter. Turner

does disclose a reference or cursor tap (fig. 4, ref. 55; col. 7, line 18) having a coefficient value greater than any of the other tap coefficients (col. 7, lines 18-21), but does not explicitly state that this tap is at the proximate center of the feedforward filter. However, Park et al teaches a feedforward filter (fig 4.) having a reference tap at the proximate center (fig. 4, ref. 311/~~[331]~~, 321, 331, 341; col. 4, line 38). Park et al further teaches that a tap to the right of the reference tap compensates a preceding signal, and a tap to the left of the reference tap compensates a next signal (col. 4, line 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to center the reference tap in the feedforward filter as taught by Park et al in the filter disclosed by Turner because it would advantageously compensate for both the preceding signals as well as the next signals for optimum performance of the filter.

Regarding claim 5, Turner in view of Park et al disclose the limitations of claim 4 as applied above. Further, Park et al discloses that the reference tap is a middle or "center" tap located at a center position (col. 4, line 38).

Regarding claim 9, Turner in view of Park et al discloses the limitations of claim 4 as applied above. Further, Turner discloses that the feedforward filter and the feedback filter cooperate to at least partially define a DFE (fig. 4; col. 1, line 9).

Regarding claim 10, Turner in view of Park et al disclose the limitations of claim 4 as applied above. Further, Turner discloses that the feedforward filter and the feedback filter cooperate to at least partially define a portion of a DSL receiver (col. 1, line 15).

Regarding claim 11, Turner discloses a transceiver comprising a transmitter, a receiver comprising a feedforward filter coupled to process signals received by the receiver having a plurality of filter taps including a reference tap located proximate a center position of the feedforward filter having a coefficient value greater than any of the other tap coefficients to enhance noise cancellation and a feedback filter coupled to receive signals representative of an output of the feedforward filter having a plurality of filter taps. Turner discloses a DFE (inherently used in a receiver) in figure 4 comprising a feedforward filter (ref. 51) with a plurality of feedforward filter taps (ref. 52) each having a coefficient (ref 53; col. 7, line 18), a reference feedforward filter tap having a coefficient value greater than any of the other tap coefficients (col. 7, lines 18-21), and a feedback filter (ref. 57) coupled to receive signals representative of an output of the feedforward filter. Turner discloses that the DFE is to be used in a DSL system (col. 1, line 15) and that the system is full duplex (col. 1, line 18). It is obvious that the DFE is to be utilized by a DSL modem which is inherently a transceiver as further implied by the use of the term "full duplex" meaning data transmission simultaneously in receive and transmit modes which requires both a transmitter and receiver to be present. Hence, the use of a transceiver having both a transmitter and a receiver is obvious. Turner does further disclose a reference or cursor tap (fig. 4, ref. 55; col. 7, line 18), but does not explicitly state that this tap is at the proximate center of the feedforward filter. However, Park et al teaches a feedforward filter (fig 4.) having a reference tap at the proximate center (fig. 4, ref. 311/[~~331~~], 321, 331, 341; col. 4, line 38). Park et al further teaches that a tap to the right of the reference tap compensates a preceding signal, and

a tap to the left of the reference tap compensates a next signal (col. 4, line 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to center the reference tap in the feedforward filter as taught by Park et al in the filter disclosed by Turner because it would advantageously compensate for both the preceding signals as well as the next signals for optimum performance of the filter.

Regarding claim 12, Turner in view of Park et al disclose the limitations of claim 11 as applied above. Further, Park discloses that the reference tap of the feedforward filter is a middle or "center" tap located at a center position (col. 4, line 38).

Regarding claim 16, Turner in view of Park et al disclose the limitations of claim 11 as applied above. Further, Turner discloses that the feedforward filter and the feedback filter cooperate to at least partially define a DFE (fig. 4; col. 1, line 9).

Regarding claim 17, Turner in view of Park et al disclose the limitations of claim 11 as applied above. Further, Turner discloses that the feedforward filter and the feedback filter cooperate to at least partially define a portion of a DSL receiver (col. 1, line 15).

Regarding claim 18, Turner discloses a communication system with a plurality of transceivers at least two of which are configured to communicate with one another comprising, a transmitter, a receiver comprising a feedforward filter coupled to process signals received by the receiver having a plurality of filter taps including a reference tap located proximate a center position of the feedforward filter having a coefficient value greater than any of the other tap coefficients to enhance noise cancellation and a

feedback filter coupled to receive signals representative of an output of the feedforward filter having a plurality of filter taps. Turner discloses a DFE (inherently used in a receiver) in figure 4 comprising a feedforward filter (ref. 51) with a plurality of feedforward filter taps (ref. 52) each having a coefficient (ref 53; col. 7, line 18), a reference feedforward filter tap having a coefficient value greater than any of the other tap coefficients (col. 7, lies 18-21), and a feedback filter (ref. 57) coupled to receive signals representative of an output of the feedforward filter. Turner discloses that the DFE is to be used in a DSL system (col. 1, line 15) and that the system is full duplex (col. 1, line 18). It is obvious that the DFE is to be utilized by a DSL modem which is inherently a transceiver as further implied by the use of the term "full duplex" meaning data transmission simultaneously in receive and transmit modes which requires both a transmitter and receiver to be present. The utility of a DSL system requires a plurality of transceivers two of which would be required to be configured to communicate. Hence, the use of a plurality of transceivers each having both a transmitter and a receiver is obvious. Turner does further disclose a reference or cursor tap (fig. 4, ref. 55; col. 7, line 18), but does not explicitly state that this tap is at the proximate center of the feedforward filter. However, Park et al teaches a feedforward filter (fig 4.) having a reference tap at the proximate center (fig. 4, ref. 311/~~[331]~~, 321, 331, 341; col. 4, line 38). Park et al further teaches that a tap to the right of the reference tap compensates a preceding signal, and a tap to the left of the reference tap compensates a next signal (col. 4, line 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to center the reference tap in the feedforward

filter as taught by Park et al in the filter disclosed by Turner because it would advantageously compensate for both the preceding signals as well as the next signals for optimum performance of the filter.

Regarding claim 19, Turner in view of Park et al disclose the limitations of claim 18 as applied above. Further, Park discloses that the reference tap of the feedforward filter is a middle or "center" tap located at a center position (col. 4, line 38).

Regarding claim 23, Turner in view of Park et al disclose the limitations of claim 18 as applied above. Further, Turner discloses that the feedforward filter and the feedback filter cooperate to at least partially define a DFE (fig. 4; col. 1, line 9).

Regarding claim 24, Turner in view of Park et al disclose the limitations of claim 18 as applied above. Further, Turner discloses that the feedforward filter and the feedback filter cooperate to at least partially define a portion of a DSL receiver (col. 1, line 15).

Regarding claim 25, Turner discloses a method for mitigating noise in a communication device comprising filtering the received signal with a feedforward filter having a plurality of feedforward filter taps including a reference tap having a coefficient value greater than any of the other tap coefficients located a proximate center position of the plurality of taps and a coefficient for each of the feedforward filter taps. Turner discloses a method of mitigating noise in a communication device by using a DFE (inherently used in a receiver) shown in figure 4 comprising a feedforward filter (ref. 51) with a plurality of feedforward filter taps (ref. 52) each having a coefficient (ref 53; col. 7, line 18) and a feedforward filter reference tap having a coefficient value greater than

any of the other tap coefficients (col. 7, lines 18-21). Turner does disclose the method using a reference or cursor tap, but does not explicitly state that this tap is at the proximate center of the feedforward filter. However, Park et al teaches a method using a feedforward filter (fig 4.) having a reference tap at the proximate center (fig. 4, ref. 311/~~[331]~~, 321, 331, 341; col. 4, line 38). Park et al further teaches that a tap to the right of the reference tap compensates a preceding signal, and a tap to the left of the reference tap compensates a next signal (col. 4, line 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to utilize the method of centering the reference tap in the feedforward filter as taught by Park et al in the filter method disclosed by Turner because it would advantageously compensate for both the preceding signals as well as the next signals for optimum performance of the filter.

Regarding claim 26, Turner in view of Park et al disclose the limitations of claim 25 as applied above. Further, Park et al discloses that the reference tap is a middle or "center" tap located at a center position (col. 4, line 38).

6. Claims 7, 8, 14, 15, 21, 22, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turner in view of Park et al and in further view of Gersho et al (4412341).

Regarding claim 7, Turner in view of Park et al disclose the limitations of claim 4 as applied above. Further, Turner discloses that the feedback filter taps have coefficients (fig. 4, ref. 63), but does not disclose that the at least one of the coefficients are clamped. However, Gersho et al teaches a filter (sole FIGURE, ref. 31) that has tap

coefficients that are clamped (col. 7, line 50). Gersho et al teaches that since it has been experimentally observed that the coefficients of the filter may become too large, the preferred way to accommodate the problem is to clamp the coefficient magnitudes not to exceed a limit (col. 7, line 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to clamp the coefficients of the feedback filter as shown by Gersho et al because, experimentally, it has been shown that they can grow too large when there is harmonic distortion in the channel which leads to errors in the symbol decisions.

Regarding claim 8, Turner in view of Park et al disclose the limitations of claim 4 as applied above. Further, Turner discloses that the feedback filter taps have coefficients (fig. 4, ref. 63), but does not disclose that all of the coefficients are clamped. However, Gersho et al teaches a filter (sole FIGURE, ref. 31) that has tap coefficients that are all clamped (col. 7, line 50). Gersho et al teaches that since it has been experimentally observed that the coefficients of the filter may become too large, the preferred way to accommodate the problem is to clamp the coefficient magnitudes not to exceed a limit (col. 7, line 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to clamp the all of the coefficients of the feedback filter as shown by Gersho et al because, experimentally, it has been shown that they can grow too large when there is harmonic distortion in the channel which leads to errors in the symbol decisions.

Regarding claim 14, Turner in view of Park et al disclose the limitations of claim 11 as applied above. Further, Turner discloses that the feedback filter taps have

coefficients (fig. 4, ref. 63), but does not disclose that the at least one of the coefficients are clamped. However, Gersho et al teaches a filter (sole FIGURE, ref. 31) that has tap coefficients that are clamped (col. 7, line 50). Gersho et al teaches that since it has been experimentally observed that the coefficients of the filter may become too large, the preferred way to accommodate the problem is to clamp the coefficient magnitudes not to exceed a limit (col. 7, line 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to clamp the coefficients of the feedback filter as shown by Gersho et al because, experimentally, it has been shown that they can grow too large when there is harmonic distortion in the channel which leads to errors in the symbol decisions.

Regarding claim 15, Turner in view of Park et al disclose the limitations of claim 11 as applied above. Further, Turner discloses that the feedback filter taps have coefficients (fig. 4, ref. 63), but does not disclose that all of the coefficients are clamped. However, Gersho et al teaches a filter (sole FIGURE, ref. 31) that has tap coefficients that are all clamped (col. 7, line 50). Gersho et al teaches that since it has been experimentally observed that the coefficients of the filter may become too large, the preferred way to accommodate the problem is to clamp the coefficient magnitudes not to exceed a limit (col. 7, line 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to clamp the all of the coefficients of the feedback filter as shown by Gersho et al because, experimentally, it has been shown that they can grow too large when there is harmonic distortion in the channel which leads to errors in the symbol decisions.

Regarding claim 21, Turner in view of Park et al disclose the limitations of claim 18 as applied above. Further, Turner discloses that the feedback filter taps have coefficients (fig. 4, ref. 63), but does not disclose that the at least one of the coefficients are clamped. However, Gersho et al teaches a filter (sole FIGURE, ref. 31) that has tap coefficients that are clamped (col. 7, line 50). Gersho et al teaches that since it has been experimentally observed that the coefficients of the filter may become too large, the preferred way to accommodate the problem is to clamp the coefficient magnitudes not to exceed a limit (col. 7, line 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to clamp the coefficients of the feedback filter as shown by Gersho et al because, experimentally, it has been shown that they can grow too large when there is harmonic distortion in the channel which leads to errors in the symbol decisions.

Regarding claim 22, Turner in view of Park et al disclose the limitations of claim 18 as applied above. Further, Turner discloses that the feedback filter taps have coefficients (fig. 4, ref. 63), but does not disclose that all of the coefficients are clamped. However, Gersho et al teaches a filter (sole FIGURE, ref. 31) that has tap coefficients that are all clamped (col. 7, line 50). Gersho et al teaches that since it has been experimentally observed that the coefficients of the filter may become too large, the preferred way to accommodate the problem is to clamp the coefficient magnitudes not to exceed a limit (col. 7, line 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to clamp the all of the coefficients of the feedback filter as shown by Gersho et al because, experimentally, it

has been shown that they can grow too large when there is harmonic distortion in the channel which leads to errors in the symbol decisions.

Regarding claim 28, Turner in view of Park et al disclose the limitations of claim 25 as applied above. Further, Turner discloses the method using a feedback filter (fig. 4, ref. 57) having a plurality of feedback filter taps with coefficients (fig. 4, ref. 63), but does not disclose that the at least one of the coefficients are clamped. However, Gersho et al teaches a filter (sole FIGURE, ref. 31) that has tap coefficients that are clamped (col. 7, line 50). Gersho et al teaches that since it has been experimentally observed that the coefficients of the filter may become too large, the preferred way to accommodate the problem is to clamp the coefficient magnitudes not to exceed a limit (col. 7, line 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to clamp the coefficients of the feedback filter as shown by Gersho et al because, experimentally, it has been shown that they can grow too large when there is harmonic distortion in the channel which leads to errors in the symbol decisions.

Regarding claim 29, Turner in view of Park et al disclose the limitations of claim 25 as applied above. Further, Turner discloses the method using a feedback filter (fig. 4, ref. 57) having a plurality of feedback filter taps with coefficients (fig. 4, ref. 63), but does not disclose that all of the coefficients are clamped. However, Gersho et al teaches a filter (sole FIGURE, ref. 31) that has tap coefficients that are all clamped (col. 7, line 50). Gersho et al teaches that since it has been experimentally observed that the coefficients of the filter may become too large, the preferred way to accommodate the

problem is to clamp the coefficient magnitudes not to exceed a limit (col. 7, line 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to clamp the all of the coefficients of the feedback filter as shown by Gersho et al because, experimentally, it has been shown that they can grow too large when there is harmonic distortion in the channel which leads to errors in the symbol decisions.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (703) 305-0374. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M Perilla
February 18, 2004

jmp

STEPHEN CHIN
SUPERVISORY PATENT EXAMINE
TECHNOLOGY CENTER 2600